**1.** For a p-type semiconductor which of the following statements is correct?

(1) Electrons are the majority carriers

(2) Holes are the minority carriers

(3) Pentavalent atoms are doped

(4) Trivalent atoms are doped

**2.** The barrier potential of a p-n junction depends on

(1) Temperature

(2) Amount of doping

(3) Type of semiconductor material

(4) All of these

**3.** Which one of the following statements is incorrect?

(1) Rolling friction is smaller than sliding friction.

(2) Frictional force opposes the relative motion.

(3) Limiting value of static friction is directly proportional to normal reaction.

(4) Coefficient of sliding friction has dimensions of length.

**4.** The moment of the force $\vec{F} = 2\hat{i} + 3\hat{j} - 6\hat{k}$ acting at (2, 0, -2) about the point (1, 1, -1) is given by

(1) $9\hat{i} + 4\hat{j} + 5\hat{k}$ (2) $2\hat{i} + 4\hat{k}$

(3) $3\hat{i} + 5j + 4\hat{k}$ (4) $2\hat{i} + 4j + 5\hat{k}$

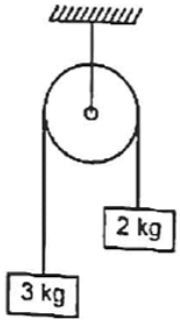
**5.** A light bulb is placed between two plane mirrors inclined at an angle of $60°$. The number of images formed are

(1) 6 (2) 2

(3) 5 (4) 4

**6.** Two masses A and B are connected through a light string which is passing over a smooth massless pulley. If $M_A$ = 2 kg and $M_a$ = 3 kg, then the work done by tension on 2 kg block in 2 seconds , after the system is released from rest will be

(Take g = 10 m/s$^2$)




(1) 96 J (2) 24 J

(3) 50 J (4) 36 J

**7.** If R be the radius of third stationary orbit and r be the radius of fourth stationary orbit of an electron in Bohr model. The ratio $\frac{r}{R}$ will be

(1) $\frac{3}{4}$ (2) $\frac{4}{3}$

(3) $\frac{16}{9}$ (4) $\frac{4}{9}$

**8.** If intensity of magnetising field (H) is 20 A/m then the value of field in air will be

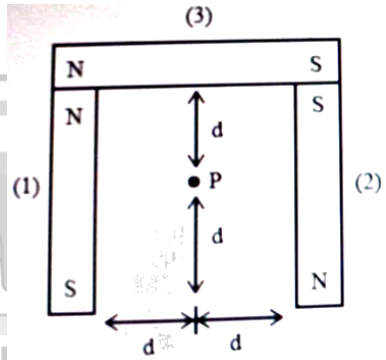
(1) $4\pi \times 10^{-6}$ T

(2) $2\pi \times 10^{-6}$ T

(3) $\pi \times 10^{-6}$ T

(4) $8\pi \times 10^{-6}$ T

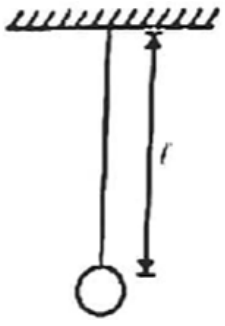
**9.** Three identical bar magnets each of magnetic moment M are placed at shown in figure. The magnetic field at point is




(1) $\frac{\mu_0}{4\pi}\frac{M}{d^3}$ (2) $\frac{\mu_0}{4\pi}\frac{2M}{d^3}$

(3) $\frac{\mu_0}{4\pi}\frac{3M}{d^3}$ (4) $\frac{\mu_0}{4\pi}\frac{4M}{d^3}$

**10.** A bob of mass m is connected through massless rod of length l as shown in the diagram given below. Velocity is given to the bob so that it can just complete a vertical circle. Then is velocity at the bottom will be




(1) $\sqrt{4gl}$ (2) $\sqrt{5gl}$

(3) $\sqrt{3gl}$ (4) $\sqrt{2gl}$

**11.** Consider the statement(s) given below and select the correct options

**Statement-A:** Action and reaction both should act on same body

**Statement B:** Action and reaction can be of different nature

(1) Statement A is correct statement B is incorrect

(2) Statement A is incorrect statement B is correct

(3) Both statements A and B are correct

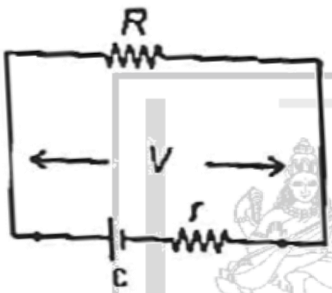
(4) Both statements A and B are incorrect

**12.** If in L-C-R circuit, power dissipated is maximum then the power factor of the circuit will be

(1) 0.2 (2) 0.5

(3) 0.3 (4) 1

**13.** The correct relationship between internal resistance(r) and external resistance (R) of given circuit is




(1) $r = (\varepsilon - V)\,R$ (2) $r = \left(\frac{\varepsilon}{V} - 1\right)R$

(3) $r = \left(\frac{V}{\varepsilon} - 1\right)R$ (4) $r = \left(\frac{V}{\varepsilon} + 1\right)R$

**14.** **Assertion (A):** In isothermal process whole of the heat energy supplied to the body is converted into internal energy

**Reason (R):** According to the first law of thermodynamics $\Delta Q = \Delta U + P\Delta V$

(1) (A) is false but (R) is true

(2) Both (A) and (R) are true and (R) is the correct explanation of (A)

(3) Both (A) and (R) are true but (R) is not the correct explanation of (A)

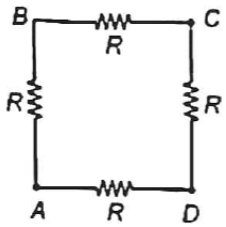
(4) (A) is true but (R) is false

**15.** The focal length of convex lens is 30 *cm* and the size of image is quarter of the object, then the object distance is

(1) 150 *cm* (2) 60 *cm*

(3) 30 *cm* (4) 40 *cm*

**16.** In the given circuit, net resistance between A and D is




(1) 3R (2) 4R

(3) $\frac{3R}{4}$ (4) $\frac{4R}{3}$

**17.** A light ray deviates by 30° when it gets refracted from vacuum to a medium at an incident angle of 90°. Refractive index of the medium is

(1) $\sqrt{5}$ (2) $\sqrt{3}$

(3) $\frac{2}{\sqrt{3}}$ (4) $\frac{2\sqrt{2}}{3}$

**18.** The intensity of sound from a point source is $1 \times 10^{-8}$ W/m$^2$ at a distance of 5 cm from the source. Intensity of sound at a distance of 25 cm, from the source will be

(1) $1.6 \times 10^{-10}$ W m$^{-2}$ (2) $0.25 \times 10^{-10}$ W m$^{-2}$

(3) $4 \times 10^{-10}$ W m$^{-2}$ (4) $6.25 \times 10^{-10}$ W m$^{-2}$

**19.** Which of the following equation can be correct of a travelling wave in any medium?

(1) $y = A\sin(\omega t - kx)$ (2) $y = A\cos^2(\omega t + kx)$

(3) $y = 2A\tan(kx - \omega t)$ (4) Both (1) and (2)

**20.** A particle undergoes SHM with a time period of 6 second. Shortest time taken by this particle in moving from its mean position to another position equal to half of its amplitude, will be

(1) $\frac{1}{12}$s (2) $\frac{1}{6}$s

(3) $\frac{1}{2}$s (4) $\frac{1}{4}$s

**21.** A rocket is fired vertically up from the ground having vertical acceleration of 5 m/s$^2$. The fuel of the rocket is finished after 10 seconds and then it continue its motion under gravity. The maximum height reached by the rocket will be

(Take g = 10 m/s$^2$)

(1) 250 m (2) 375 m

(3) 125 m (4) 200 m

**22.** Due to rotation of earth, the apparent weight of a body

(1) Decreases

(2) Increases

(3) May increases or decrease

(4) Neither increase nor decrease

**23.** In a mercury thermometer, the ice point is marked as 20° and the steam point is marked as 80°. At 60°C temperature, the reading of the above thermometer will be

(1) 50° (2) 30°

(3) 58° (4) 56°

**24.** The thermal capacity of 40 *gm* of aluminium (specific heat = 0.2 *cal/gm/°C*) is

(1) 40 *cal/°C*

(2) 160 *cal/°C*

(3) 200 *cal/°C*

(4) 8 *cal/°C*

**25.** Inside an isolated charged conducting spherical shell, the electric field is

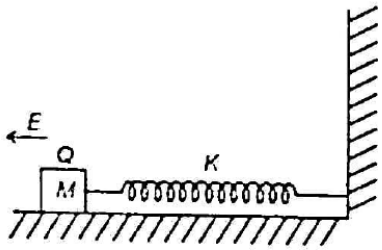
(1) Always positive

(2) Always negative

(3) Either positive or negative

(4) Always zero

**26.** A block of mass M and charge Q performs SHM on a frictionless surface with frequency f and amplitude A. Suddenly a uniform electric field is switched on as shown then SHM of the block will be




(1) Of the same frequency and same mean position

(2) Of the same frequency and shifted mean position

(3) Of changed frequency and shifted mean position

(4) Of changed frequency and same mean position

**27.** Light with an energy flux of 15 W/cm$^2$ fall on a perfectly reflecting surface at normal incidence. If the surface has an area of 30 cm$^2$ the average force exerted on the surface during 30 minute time duration, will be

(1) $3 \times 10^{-6}$ N (2) $1.5 \times 10^{-6}$ N

(3) $2 \times 10^{-6}$ N (4) $5 \times 10^{-6}$ N

**28.** In an isobaric process. Change in internal energy is given by (Symbols have their usual meanings)

(1) $nC_c\Delta T$ (2) $nC_v\Delta T$

(3) Zero (4) $P\Delta V$

**29.** The interference pattern is obtained with two coherent light sources of intensity ratio n. In the interference pattern the ratio $\frac{I_{max} - I_{min}}{I_{max} + I_{min}}$

(1) $\frac{2\sqrt{n}}{(n+1)^2}$ (2) $\frac{\sqrt{n}}{n+1}$

(3) $\frac{2\sqrt{n}}{n+1}$ (4) $\frac{\sqrt{n}}{(n+1)^2}$

**30.** The direction of magnetic field lines close to a straight conductor carrying will be

(1) Along the length of the conductor

(2) Radially outward

(3) Circular in a plane perpendicular to the conductor

(4) Helical

**31.** The value of surface tension of a liquid at critical temperature is

(1) Zero

(2) Infinite

(3) Between 0 and $\infty$

(4) Cannot be determined

**32.** The frequency of a photon having linear momentum $3.3 \times 10^{-29}$ kg m/s vacuum is ($h - 6.6 \times 10^{-34}$ J a)

(1) $1.5 \times 10^{13}$ Hz (2) $1.2 \times 10^{12}$ Hz

(3) $1.6 \times 10^{13}$ Hz (4) $1.7 \times 10^{11}$ Hz

**33.** The bulk modulus of elasticity for an ideal gas in adiabatic process is

(1) is proportional to pressure

(2) is always zero

(3) Exists only at absolute zero

(4) is infinite

**34.** Two resistances $R_1 = (20 \pm 1)\ \Omega$ and $R_2 = (10 \pm 1)\Omega$ are connected in series.

The equivalent resistance ($R_{eq}$) is

(1) $(18 \pm 2)\ \Omega$

(2) $(30 \pm 1)\ \Omega$

(3) $(6.6 \pm 1)\ \Omega$

(4) $(30 \pm 2)\ \Omega$

**35.** Given blow are two statements:

| Column -I | | Column -II | |
|---|---|---|---|
| (i) | n → p +..... | (a) | α–decay |
| (ii) | p → n +..... | (b) | Positron emission |
| (iii) | x–ray emission | (c) | $\beta^-$ emission |
| (iv) | $^{226}_{88}Ra \rightarrow ^{222}_{86} +$ ____ | (d) | K electron capture |

(1) i – c, ii – b, iii – b, iv – d

(2) i – b, ii – c, iii – d, iv – a

(3) i – c, ii – b, iii – d, iv – a

(4) i – b, ii – d, iii – c, iv – a

**36.** If the dimensions of a physical quantities are given by $M^xL^yT^z$, then physical quantities will be

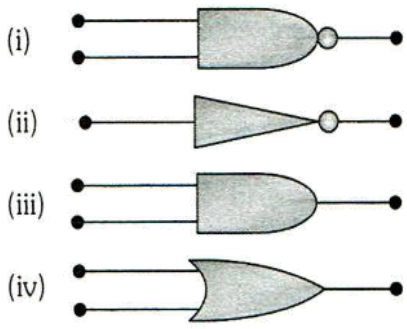
(1) Terminal velocity if x = 0, y = 1, z = 1

(2) Force if x = 0, y = –1, z = 2

(3) Energy density if x=1, y = 1, z = -2

(4) Surface tension if x= 1, y = 0, z = - 2

**37.** The symbolic representation of four logic gates are given below




The logic symbols for OR, NOT and NAND gates are respectively

(1) (iii), (iv), (ii)

(2) (iv), (i), (iii)

(3) (iv), (ii), (i)

(4) (i), (iii), (iv)

**38.** Consider the following statements and choose the correct option.

**Statement-**A: Centre of gravity of a body is the point at which whole weight of the body assumed to be act

**Statement –**B: Centre of mass may coincide with the centre of gravity.

(1) Statement A is correct while B is incorrect

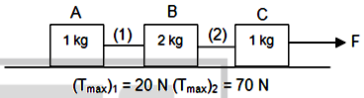
(2) Statement A is incorrect while B is correct

(3) Both statements A and B are correct

(4) Both statements A and B are incorrect

**39.** There are the three masses A, B and C. $M_A$ = 1 kg. Connected through two strings as shown in diagram given below. If acceleration of the system is increasing slowly then which of the two string will break first?

(Given all the surface are smooth)



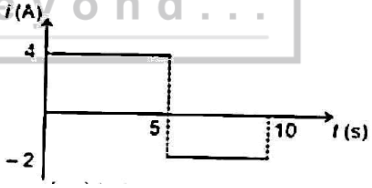

(1) String (1)

(2) String (2)

(3) Both will break together

(4) Data insufficient

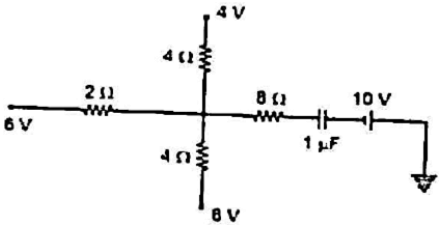
**40.** The rms value of current in the situation given below will be




(1) $2\sqrt{2}$ A (2) $\sqrt{10}$ A

(3) $2\sqrt{5}$ A (4) 6 A

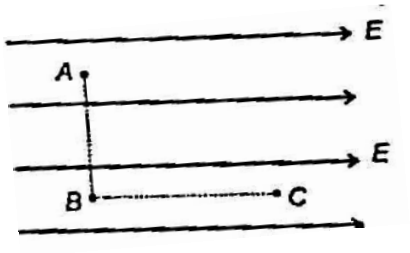
**41.** In the network shown below. Find the charge on the capacitor in steady state




(1) 4 μC (2) 8 μC

(3) 10 μC (4) 16 μC

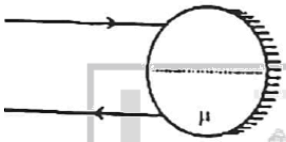
**42.** Figure shows three points A, B and C in a region of uniform electric field $\vec{E}$. The line AB $\perp$ BC and $\overline{BC} \| \vec{E}$. Which of the following holds good if $V_A$, $V_B$ and $V_C$ are electric potential at these points?




(1) $V_A = V_B = V_C$ (2) $V_A = V_B > V_C$

(3) $V_A = V_B < V_C$ (4) $V_A > V_B = V_C$

**43.** A transparent cylinder has its right half polished so as to act as a mirror. A paraxial light ray is incident from left that is parallel to principal axis, exits as shown. The refractive index $\mu$ of the material of the cylinder is




(1) 1 (2) 3

(3) 2 (4) 4

**44.** A vessel contains 2 g oxygen at 47°C and 10 atmospheric pressure. After some time, due to a leakage, the pressure drops to $\frac{25}{4}$ atm and the temperature becomes 27°C, mass of the oxygen that leaked out

(1) 3 g (2) 2/3 g

(3) 1/6 g (4) 1/3 g

**45.** Two identical solid copper spheres of radius R placed in contact with each other. The gravitational attraction between them is proportional to

(1) $R^2$ (2) $R^{-2}$

(3) $R^4$ (4) $R^{-4}$

**46.** **Assertion:** In $H_3PO_3$, basicity of the oxy acid is two.

**Reason:** One H-atom is non-ionizable in more stable tautomeric form of $H_3PO_3$.

(1) Both (A) and (R) are correct but (R) is the not correct explanation of (A)

(2) (A) is correct but (R) is not correct

(3) (A) is not correct but (R) is correct

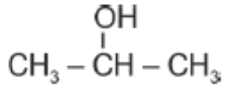
(4) Both (A) and (R) are correct and (R) is the correct explanation of (A)

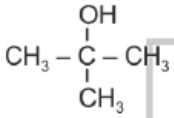
**47.** In which of the following molecule all the bond lengths are not equal?

(1) $XeF_4$ (2) $PCl_5$

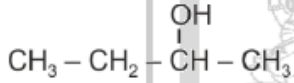
(3) $SF_6$ (4) $CH_4$

**48.** Which of the following alcohols gives red colour in the Victor Meyer's test?

(1) 

(2) 

(3) $CH_3CH_2CH_2$–OH

(4) 

**49.** Which among the following ion has highest limiting molar conductivity in water at 298K?

(1) $Ca^{2+}$ (2) $Br^-$

(3) $SO_4^{2-}$ (4) $H^+$

**50.** Which of the following contains the largest mass of hydrogen atoms?

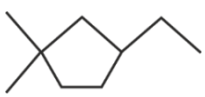
(1) 5.0 moles $C_2H_2O_4$

(2) 1.1 moles $C_3H_8O_3$

(3) 1.5 moles $C_6H_8O_6$

(4) 4.0moles $C_2H_4O_2$

**51.** IUPAC name of the given compound is



(1) 1-Ethyl-4, 4-dimethylcyclopentane

(2) 3-Ethyl-1, 1-dimethylcyclopentane

(3) 1-Ethyl-3, 3-dimethylcyclopentane

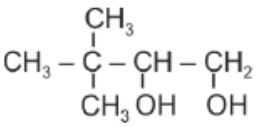
(4) 4-Ethyl-1, 1-dimethylcyclopentane

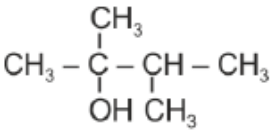
**52.** Consider the following reaction sequence

$$(CH_3)_3C-CHBr-CH_2Br \xrightarrow{Zn}$$

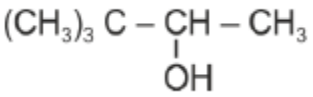
$$A \xrightarrow[(ii)H_2O_2/\bar{O}H]{(i)B_2H_6} B(Major)$$

Major product B is

(1) 

(2) 

(3) $(CH_3)_3C - CH_2 - CH_2 - OH$

(4) 

**53.** Which among the following is a purine base?

(1) Cytosine

(2) Thymine

(3) Uracil

(4) Guanine

**54.** **Assertion:** One geometrical isomer of $[M(en)_2Cl_2]^{\pm}$ is optically active, but other is optically inactive.

**Reason:** Trans geometrical isomer posses plane of symmetry but cis-isomer has no plane of symmetry.

(1) Both (A) and (R) are correct but (R) is the not correct explanation of (A)

(2) (A) is correct but (R) is not correct

(3) (A) is not correct but (R) is correct

(4) Both (A) and (R) are correct and (R) is the correct explanation of (A)

**55.** The relation between molarity (M) and molality (m) is given by:(ρ=density of solution,$M_1$=molecular weight of solute )

(1) $m = \dfrac{1000M}{1000\rho - M_1}$

(2) $m = \dfrac{1000\rho M}{1000\rho - MM_1}$

(3) $m = \dfrac{1000MM}{1000\rho - MM_1}$

(4) $m = \dfrac{1000M}{1000\rho - MM_1}$

**56.** Which among the following complexes is homoleptic?

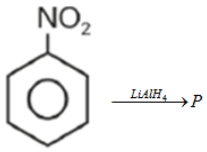
(1) $[Co(en)_3]Cl_3$

(2) $[Co(en)(ox)(H_2O)_2]Cl$

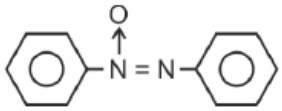
(3) $[NiCl_2Br_2]$

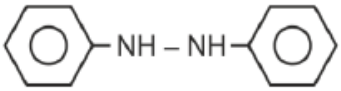
(4) $[Fe(H_2O)_5NO]SO_4$

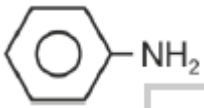
**57.** Consider the following reaction,

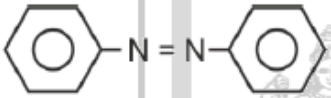



Major product (P) is

(1) 

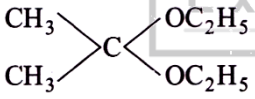

(2) 

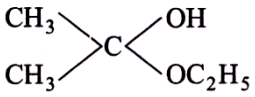

(3) 

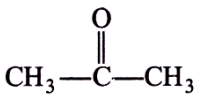

(4) 


**58.** Which of the following compounds give negative test with Tollens' reagent?

(a) 

(b) 

(c) 

(d) 

(1) (b), (c) and (d) only

(2) (a) and (d) only

(3) (b) and (d) only

(4) (c) and (d) only

**59.** Which of the following on reaction with Grignard reagent followed by hydrolysis give primary alcohol?

(1) HCHO (2) $CH_3OH$

(3) $CO_2$ (4) $CH_3COCH_3$

**60.** **Statement I:** Aq. copper (I) cation undergoes disproportionation as:

$$2Cu^{+}_{(aq.)} \rightarrow Cu^{2+}_{(aq.)} + Cu$$

**Statement II:** Hydration energy of $Cu^{2+}$ higher than that of $Cu^{+}$ which compensates second ionisation energy of Cu.

In the light of above statements, choose the correct option.

(1) Statement I is correct but statement II is incorrect

(2) Statement I is incorrect but statement II is correct

(3) Both statement I and statement II are correct

(4) Both statement I and statement II are incorrect

**61.** The ratio of the radius difference between $4^{th}$ and $3^{rd}$ orbit of H–atom and that of $Li^{2+}$ ion is:

(1) 1: 1

(2) 3: 1

(3) 3: 4

(4) 9: 1

**62.** Which of the following molecules is non – polar in nature?

(1) $NO_2$

(2) $POCl_3$

(3) $CH_2O$

(4) $SbCl_5$

**63.** When a salt of weak acid and weak base is dissolved in water at 25°C, the pH of the resulting solution will always:

(1) be 7

(2) be greater than 7

(3) be less than 7

(4) depend on $K_a$ and $K_b$ values

**64.** Which of the following do not undergo hydrolysis?

(a) Glucose

(b) Fructose

(c) Cane sugar

(d) Maltose

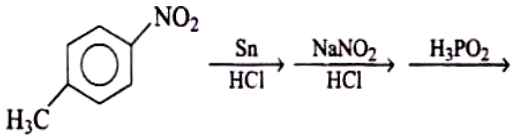
(1) (b), (c) and (d) only

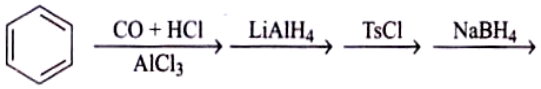
(2) (a) and (b) only

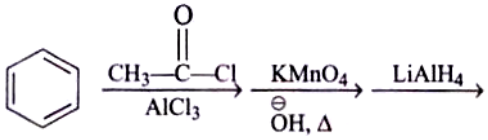
(3) (b) and (d) only

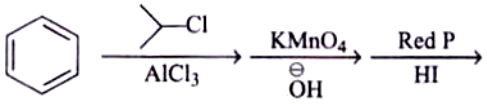
(4) (c) and (d) only

**65.** Which of the following are suppose to produce toluene?

(a) 

(b) 

(c) 

(d) 

(1) (b), (c) and (d)

(2) (a) and (d)

(3) (a) and (c)

(4) (a), (b) and (d)

**66.** For the cell, $Pt|Cl_2(g,\ 0.4\ bar)|Cl^-(aq,0.1M)||Cl^-(aq,\ 0.01\ M)|Cl_2(g,0.2bar)|Pt$

The measured potential at 298 K is:

(1) 0.051 V

(2) – 0.051 v

(3) 0.102 V

(4) 0.0255 V

**67.** In a vessel containing $N_2$, $H_2$ and $NH_3$at equilibrium, some helium gas is introduced so that total pressure increase while temperature and volume remain constant. According to Le Chatelier's principle, the dissociation of $NH_3$:

(1) Increases

(2) Decreases

(3) remains unaltered

(4) Changes unpredictably

**68.** **Assertion:** $H_2SO_4$ is a weaker acid than $HClO_4$.

**Reason:** $SO_4^{2-}$ is more stable than $ClO_4^-$ in solution.

(1) Both (A) and (R) are correct but (R) is the not correct explanation of (A)

(2) (A) is correct but (R) is not correct

(3) (A) is not correct but (R) is correct

(4) Both (A) and (R) are correct and (R) is the correct explanation of (A)

**69.** The correct relation for Heisenberg's uncertainty principle is represented by

(1) $\Delta x\times\Delta p\le\frac{h}{4\pi}$ (2) $\Delta x\times\Delta p\ge\frac{h}{2\pi}$

(3) $\Delta x\times\Delta p\le\frac{h}{2\pi}$ (4) $\Delta x\times\Delta p\ge\frac{h}{4\pi}$

**70.** If 'a' is the initial concentration of the reactant, the half–life period of the reaction of $n^{th}$ order is inversely proportional to:

(1) $a^{n-1}$ (2) $a^n$

(3) $a^{1-n}$ (4) $a^{n+1}$

**71.** 1 mol of an ideal gas expanded reversibly from 10 L to 100 L at 27°C. Work done involved in the process is

(1) –11.5 kJ (2) –5.74 kJ

(3) –57.4 kJ (4) –109.8 kJ

**72.** Molar solubility of $Zn(OH)_2$ in 0.1 M NaOH solution is ($K_{sp}$ $Zn(OH)_2 = 1\times10^{-15}$)

(1) $10^{-9}$ M (2) $10^{-13}$ M

(3) $10^{-14}$ M (4) $10^{-15}$ M

**73.** Molarity of 6% (w/v) glucose solution will be

(1) 1 M (2) $\frac{M}{3}$

(3) $\frac{M}{4}$ (4) $\frac{M}{6}$

**74.** Which of the following is not true for a solution that shows negative deviation from Raoult's law?

(1) $\Delta_{mix}H<0$ (2) $\Delta_{mix}V<0$

(3) $\Delta_{mix}G<0$ (4) $\Delta_{mix}S<0$

**75.** The e.m.f. of the following galvanic cells :

(I) $Zn|Zn^{2+}(1M)||Cu^{2+}(1M)|Cu$

(II) $Zn|Zn^{2+}(0.1M)||Cu^{2+}(1M)|Cu$

(III) $Zn|Zn^{2+}(1M)||Cu^{2+}(0.1M)|Cu$

(IV) $Zn|Zn^{2+}(0.1M)||Cu^{2+}(0.1M)|Cu$

Are represented by $E_1$, $E_2$, $E_3$ and $E_4$. Which of the following statement is true?

(1) $E_1>E_2>E_3>E_4$

(2) $E_3>E_2>E_1>E_4$

(3) $E_3>E_1=E_4>E_2$

(4) $E_2>E_1=E_4>E_3$

**76.** **Assertion:** There is no lanthanoide with electronic configuration $3d^7$.

**Reason:** All lanthanoides are radioactive.

(1) Both (A) and (R) are correct but (R) is the not correct explanation of (A)

(2) (A) is correct but (R) is not correct

(3) (A) is not correct but (R) is correct

(4) Both (A) and (R) are correct and (R) is the correct explanation of (A)

**77.** Ratio of time taken for 99.9% and 99% completion of a first order reaction is

(1) $\frac{2}{1}$ (2) $\frac{10}{1}$

(3) $\frac{3}{2}$ (4) $\frac{9}{1}$

**78.** If the molar conductivity of $10^{-3}$ M HA is 39 S $cm^2mol^{-1}$, then its dissociation constant will be [Given: $\Lambda_m^\circ$ (HA) = 390 S $cm^2mol^{-1}$]

(1) $10^{-7}$ M (2) $10^{-6}$ M

(3) $10^{-8}$ M (4) $10^{-5}$ M

**79.** **Statement I:** Furan is a heterocyclic aromatic compound.

**Statement II:** Furan contains a nitrogen atom in the ring.

In the light of the above statements, choose the correct answer from the options given below.

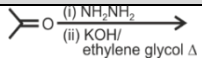
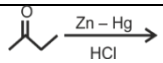
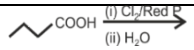
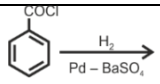
(1) Statement I is incorrect but statement II is correct

(2) Both statement I and statement II are correct

(3) Both statement I and statement II are incorrect

(4) Statement I is correct but statement II is incorrect

**80.** Match List I with List II.

| | List I | | List II |
|---|---|---|---|
| (a) |  | (i) | Rosenmund reduction |
| (b) |  | (ii) | HVZ reaction |
| (c) |  | (iii) | Wolff-Kishner reduction |
| (d) |  | (iv) | Clemmensen reduction |

Choose the correct answer from the options given below.

(1) (a) – (iv), (b) – (iii), (c) – (i), (d) – (ii)

(2) (a) – (iii), (b) – (iv), (c) – (i), (d) – (ii)

(3) (a) – (i), (b) – (iv), (c) – (ii), (d) – (iii)

(4) (a) – (iii), (b) – (iv), (c) – (ii), (d) – (i)

**81.** How many electrons would flow through a metallic wire in which a current of 0.5 ampere flows for 2 hours?

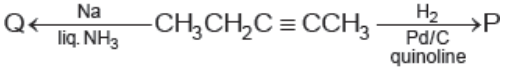
(1) $2.25 \times 10^{22}$

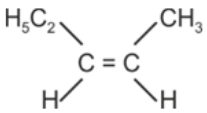
(2) $3.75 \times 10^{21}$

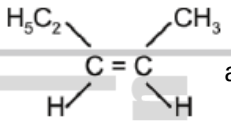
(3) $6.25 \times 10^{20}$

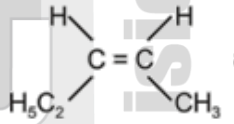
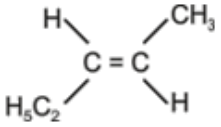
(4) $1.25 \times 10^{23}$

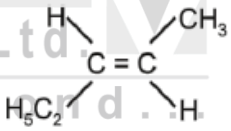
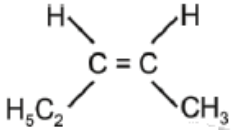
**82.** In the given reactions the major products P and Q respectively are



(1) $CH_3CH_2CH_2CH_2CH_3$ and 

(2)  and $CH_3CH_2CH_2CH_2CH_3$

(3)  and 

(4)  and 

**83.** For which of the following order, rate constant and rate of reaction have same units?

(1) 0 (2) 1

(3) 2 (4) 3

**84.** $K_{sp}$ of $Zr_3(PO_4)_4$ in terms of solubility (S) is :

(1) 108 $S^7$

(2) 4 $S^3$

(3) 6912 $S^7$

(4) None of these

**85.** For the second period elements the **correct** increasing order of first ionisation enthalpy is

(1) $Li < B < Be < C < O < N < F < Ne$

(2) $Li < B < Be < C < N < O < F < Ne$

(3) $Li < Be < B < C < O < N < F < Ne$

(4) $Li < Be < B < C < N < O < F < Ne$

**86.** Which of the following contains ionic, covalent and coordinate bonds?

(1) NaCN

(2) $PH_4Cl$

(3) $CH_3COONa$

(4) $N_3H$

**87.** Addition of catalyst in an equilibrium alters the

(1) Equilibrium constant

(2) Equilibrium concentrations of reactants

(3) Rates of forward and reversed reactions

(4) Equilibrium concentrations of products

**88.** Which among the following complex species isoptically active?

(1) $K_4[Fe(CN)_6]$

(2) $K_2[NiCl_4]$

(3) $cis[Co(en)_2ClBr]$

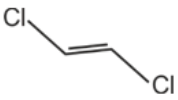
(4) $[Zn(H_2O)_4]Cl_2$

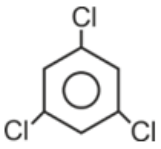
**89.** Phthalimide on treatment with ethanolic NaOH forms a compound X which on heating with benzyl chloride followed by alkaline hydrolysis gives

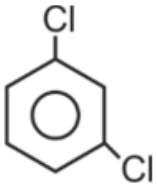
(1) Aniline (2) Benzylamine

(3) Phenol (4) Benzamide

**90.** Non-polar molecule among the following is/are

(a) 


(b) 


(c) 


(d) 


(1) (a) and (d) only

(2) (a), (b), (c) and (d)

(3) (a),(b) and (d) only

(4) (b) and (d) only

**91.** Which among the following organelle(s) is/are not included in endomembrane system

(i) Golgi apparatus (ii) Peroxisomes
(iii) Lysosomes (iv) Vacuoles
(v) Mitochondria

(1) ii, iii and iv only
(2) ii and v only
(3) ii only
(4) i and v only

**92.** **Statement I:** Immediately after light becomes unavailable, the biosynthetic process continue for some time, and then stops.

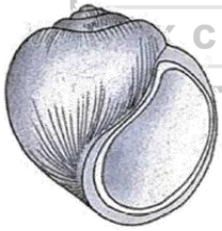
**Statement II:** Chemiosmosis require a membrane, a proton pump, a proton gradient and ATPs.

(1) Both Statement I and Statement II are false.
(2) Statement I is true but Statement II is false.
(3) Statement I is false but Statement II is true.
(4) Both Statement I and Statement II are true.

**93.** Unicellular glands present in glandular epithelium are

(1) Salivary glands
(2) Goblet cells of the alimentary canal
(3) Typical gastric glands in stomach
(4) Brunner's glands of large intestine

**94.** Identify the figure given below and select the **incorrect** option w.r.t. it.



(1) Mouth contains radula for feeding
(2) Bilaterally symmetrical
(3) Calcareous exoskeleton
(4) Unsegmented body

**95.** Crop and gizzard is related to digestive tract of

(1) *Pavo* (2) *Testudo*
(3) *Limulus* (4) *Myxine*

**96.** The flowers are actinomorphic in

(1) Cassia plant
(2) Gulmohur plant
(3) Pea plant
(4) Mustard plant

**97.** Read the given characteristics and identify the organisms based on the characteristics

a. Cell wall absent
b. Photosynthetic pigments are present
c. Aquatic forms
d. Biflagellated

(1) Diatoms (2) Dinoflagellates
(3) Euglenoids (4) Desmids

**98.** Select the **correct** statement for the dihybrid crosses conducted by Morgan on *Drosophila*.

(A) These crosses were similar to the crosses carried out by Mendel in peas
(B) He carried out crosses to study X-linked genes
(C) Genes for body color and eye color were found to be on different chromosomes
(D) $F_2$ ration deviated very significantly from the 9 : 3 : 3 : 1 ratio

(1) A and C only
(2) A and D only
(3) A, B and D only
(4) C only

**99.** Symbol for affected male in pedigree is shown by

(1)  (2) 

(3)  (4) 

**100.** Conidia on germination produce

(1) Haploid mycelium
(2) Diploid hyphae
(3) Haploid Ascospores
(4) Diploid asci

**101.** Which of the following organisms produce some sperms which lack sex chromosomes?

(1) Humans (2) Drosophila
(3) Grasshopper (4) Birds

**102.** **Statement I:** Animal cells have a cell wall outside the cell membrane.

**Statement II:** The plasma membrane is selectively permeable and facilitates transport of several molecules.

(1) Both Statement I and Statement II are false.
(2) Statement I is true but Statement II is false.
(3) Statement I is false but Statement II is true.
(4) Both Statement I and Statement II are true.

**103.** How many ATP molecules are produced when one molecule of pyruvic acid is completely oxidized?
(1) 12 (2) 15
(3) 28 (4) 36

**104.** **Assertion A:** Phenylketonuria is an pleiotropic disease.
**Reason R:** In PKU mutation in single gene manifests itself through many phenotypic expression like mental retardation, reduction in hair and skin pigmentation
(1) Both A and R are true but R is NOT the correct explanation of A.
(2) A is true but R is false.
(3) A is false but R is true.
(4) Both A and R are true and R is the correct explanation of A.

**105.** Plants capture only __A__ of the photosynthetically active radiation (PAR). Select the **correct** option to fill in the blank A.
(1) 1-5%
(2) 2-10%
(3) 50%
(4) 0.4-1%

**106.** During plant growth, increased vacuolation is the characteristic of the cells in the
(1) Meristematic phase of growth
(2) Phase of elongation
(3) Phase of maturation
(4) Phase of active cell division

**107.** All of the following are methods of asexual reproduction, except
(1) Binary fission
(2) Fusion of gametes
(3) Fragmentation
(4) Vegetative propagation

**108.** **Statement I:** Double fertilization involves 5 haploid nuclei
**Statement II:** In most of the flowering plants one megaspore degenerates and rest 3 develop into female gametophytes
(1) Both Statement I and Statement II are false.
(2) Statement I is true but Statement II is false.
(3) Statement I is false but Statement II is true.
(4) Both Statement I and Statement II are true.

**109.** Swiss cheese is formed using
(1) Aspergillus niger
(2) Penicillium notatum
(3) Saccharomyces cerevisiae
(4) Propionibacterium *sharmanii*

**110.** Malonate is a competitive inhibitor of succinic dehydrogenase as it closely resembles in structure with
(1) Citric acid (2) Maltose
(3) Succinate (4) Malonic acid

**111.** Choose the option to fill in the blank **correctly**. _____ is a polymer of fructose.
(1) Insulin (2) Inulin
(3) Glycogen (4) Cellulose

**112.** Cancer can be treated by all of the following except
(1) Surgery (2) Radiography
(3) Chemotherapy (4) Immunotherapy

**113.** In the wheat plant
(1) Direct elongation of the plumule leads to the formation of primary root
(2) The tap root system is seen
(3) Primary root is short lived
(4) Fibrous roots are absent

**114.** Which of the following are NOT considered as the part of meiosis prophase I?
A. Diplotene B. Leptotene
C. Pachytene D. Diakinesis
E. Laminarin
Choose the most appropriate answer form the options given below:
(1) A, C and E only (2) A and D only
(3) A, D and E only (4) E only

**115.** Which of the following is correctly matched?
(1) Leptotene – Synapsis
(2) Zygotene – Crossing over
(3) Pachytene – Condensation of chromatin fibres begins
(4) Diakinesis – Terminalisation of chiasmata

**116.** Read the following features and identify the phase in which it occurs.
a. Phase of differentiation.
b. Cells of the phase are metabolically active but no longer proliferate.
c. Shown by heart cells.
(1) $G_0$ phase (2) $G_1$ phase
(3) S - phase (4) $G_2$ phase

**117.** Select the **incorrect** match w.r.t. Bryophytes

| | | |
|---|---|---|
| (1) | *Funaria* | – Production of biflagellated antherozoids |
| (2) | *Polytrichum* | – Consist of protonema and leafy stages |
| (3) | *Sphagnum* | – Vegetative reproductive by fragmentation |
| (4) | *Marchantia* | – Heterosporous in nature |

**118.** Pollination in gymnosperms is achieved by:

(1) Wind (2) Water

(3) Insects (4) Bats

**119.** Different variants of *Rauwolfia vomitoria* growing in different Himalayan ranges are examples of

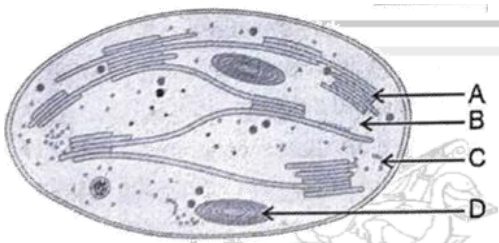
(1) Ecological diversity

(2) Species diversity

(3) Genetic diversity

(4) Community diversity

**120.** The given diagram represents electron micrograph of a section of chloroplast.




Choose the **correct** option regarding the labelled structure A, B, C and D.

(1) 'D' is the place where C – C bonds are broken down to produce ATP

(2) 'B' has the enzymes for the synthesis of proteins as well as for fixation of $CO_2$

(3) 'A' is involved in the production of ATP by oxidation of NADPH

(4) 'C' stores starch around the protein particles

**121.** The nitrogenous base that is neither present in start codon nor in stop codons is

(1) Guanine (2) Adenine

(3) Uracil (4) Cytosine

**122.** 80S type of ribosomes are found in

(1) Mitochondria (2) Eukaryotic cell

(3) Bacteria (4) Chloroplast

**123.** How many palindromic sites for digestion by EcoRI are essentially needed for simplistic gene cloning?

(1) Four (2) One

(3) Multiple (4) Five

**124.** **Assertion (A):** The repressor of the lac operon is synthesized all the time from *i* gene.

**Reason (R):** Repressor protein binds to operator region to prevent RNA polymerase from transcribing the operon.

(1) Both (A) and (R) are true statements and (R) is the correct explanation of (A)

(2) Both (A) and (R) are true statements but (R) is not the true explanation of (A)

(3) Only statement (A) is true

(4) Both the statements (A) and (R) are false

**125.** When both parents are normal but have alleles for sickle cell anaemia, then what is the probability of their offspring to be homozygous normal?

(1) $\frac{3}{4}$ (2) $\frac{1}{4}$

(3) $\frac{1}{2}$ (4) 1

**126.** **Statement I:** Species like *Selaginella* and *Salvinia* are heterosporous

**Statement II:** In gymnosperm cones bearing megasporangia are called female strobili.

(1) Both Statement I and Statement II are false.

(2) Statement I is true but Statement II is false.

(3) Statement I is false but Statement II is true.

(4) Both Statement I and Statement II are true.

**127.** Fascicular cambium, interfascicular cambium and cork cambium are example of

(1) Intercalary meristem

(2) Lateral meristem

(3) Primary meristem

(4) Axillary bud

**128.** Consider the following floral features.

a. Persistent calyx

b. Placenta swollen with one ovule

c. Fruit pod or capsule

d. Albuminous seed

e. Ex –stipulate leaves

Which of the given characteristics the found in solanaceae?

(1) a, b, d and e (2) a, d and e

(3) a, c, d and e (4) b, d and e

**129.** **Assertion (A):** Archaebacteria can survive in extreme conditions.

**Reason (R):** They have different cell wall structure than bacteria.

(1) Both (A) and (R) are correct but (R) is not correct explanation of (A)

(2) Both (A) and (R) are correct and (R) is correct explanation of (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

**130.** Read the following statements stating them true(T) or false(F) and select the correct option.

A. By process of leaching water-soluble inorganic nutrients go down into the soil horizon and get precipitated as available salts

B. Although oceans occupy 70% of earth's surface the productivity of oceans are only 55 billion tons

C. Common herbivores in terrestrial ecosystem are insects, birds and mammals

| | A | B | C |
|---|---|---|---|
| (1) | T | F | F |
| (2) | T | F | T |
| (3) | F | T | T |
| (4) | F | F | T |

**131.** **Statement I:** Bakane is a disease caused by bacteria

**Statement II:** The plants when treated with sterile filtrate of disease-causing organism showed bakane disease symptoms

(1) Both Statement I and Statement II are false.

(2) Statement I is true but Statement II is false.

(3) Statement I is false but Statement II is true.

(4) Both Statement I and Statement II are true.

**132.** In some plants as __A__ growing in swampy areas, many roots come out of the ground and grow vertically upwards, such roots are called __B__.

| | A | B |
|---|---|---|
| (1) | *Azotobacter* | *Mycorrhizae* |
| (2) | *Banyan* | prop |
| (3) | *Rhizophora* | pneumatophores |
| (4) | *Rhizobium* | tap root |

**133.** Double fertilization is observed in

(1) Gymnosperms (2) Angiosperms

(3) Pteridophytes (4) Bryophytes

**134.** Match the given columns.

| Column I | Column II |
|---|---|
| a. ESTs | i. Mainly in eukaryotes |
| b. YAC | ii. All genes that are expressed as RNA |
| c. Polymorphism | iii. Vectors for human gene cloning |
| d. Monocistronic gene | iv. Variation at genetic level |

Choose the correct option.

(1) a(ii), b(iv), c(iii), d(i)

(2) a(iv), b(iii), c(ii), d(i)

(3) a(iv), b(iii), c(i), d(ii)

(4) a(ii), b(iii), c(iv), d(i)

**135.** An orchid growing as an *epiphyte* on the mango branch is an example of

(1) Parasitism (2) Commensalism

(3) Mutualism (4) Predation

**136.** The technique of DNA fingerprinting involves many steps. Which of the following is done just before and after digestion of DNA by restriction endonuclease, respectively?

(1) Blotting of DNA to synthetic membranes and hybridization using VNTR probes

(2) Isolation of DNA and separation of DNA fragments by electrophoresis

(3) Detection of hybridized DNA fragments and isolation of DNA

(4) Hybridisation of DNA and separation of DNA fragments

**137.** Skeletal connective tissue is composed of (A) and (B). (B) has slightly pliable matrix due to the presence of

(1) Calcium salts (2) Chondroitin salts

(3) Phosphate salts (4) Magnesium salts

**138.** Jawless fishes probably evolved around

(1) 350 mya (2) 320 mya

(3) 500 mya (4) 250 mya

**139.** Choose the incorrect match w.r.t. movements.

(1) Macrophages – Amoeboid movement

(2) Euglena – Flagellar movement

(3) Hydra – Ciliary movement

(4) Tongue – Muscular movement

**140.** Match the following columns and select the **correct** option.

| Column I | Column II |
|---|---|
| a. Habitat loss and fragmentation | i. Occurs in organisms associated in an obligatory way |
| b. Co-extinction | ii. Cause of extinction of Steller's Sea cow |
| c. Alien species invasion | iii. *Eichhornia* in India |
| d. Over-exploitation | iv. Most important cause of biodiversity loss |

(1) a(iv), b(ii), c(i), d(iii)
(2) a(iv), b(i), c(iii), d(ii)
(3) a(ii), b(iv), c(i), d(iii)
(4) a(ii), b(i), c(iv), d(iii)

**141.** The IUCN red list 2004 documents the extinction of how many species occur in last five hundred years
(1) 487 (2) 359
(3) 784 (4) 338

**142.** In marine fishes 'A' produced by metabolism is converted into 'B' in the liver and released into the blood.
Choose the **correct** option which identifies A and B correctly.

| | A | B |
|---|---|---|
| (1) | Uric acid | Ammonia |
| (2) | Ammonia | Uric acid |
| (3) | Urea | Ammonia |
| (4) | Ammonia | Urea |

**143.** Choose the **incorrect** statement w.r.t. kidneys.
(A) Glomerulus is a tuft of capillaries formed by a fine branch of renal vein
(B) Bowman's capsule along with glomerulus, is called the renal corpuscle
(C) Each kidney has nearly 1 million complex tubular structures
(D) Collecting duct is not a part of uriniferous tubule
(1) A and D only
(2) A and C only
(3) B and D only
(4) A only

**144.** **Statement I:** Mendel's law is use to explain the expression of only one of the parental characters in a monohybrid cross in the $F_1$.
**Statement II:** Monohybrid cross also explain the proportion of 3:1 obtained in $F_2$.
(1) Both Statement I and Statement II are false.
(2) Statement I is true but Statement II is false.
(3) Statement I is false but Statement II is true.
(4) Both Statement I and Statement II are true.

**145.** Bt-toxins are insect-group specific. Which of the following insect groups is controlled by proteins encoded by cryIIAb?
(1) Corn borer (2) Cotton bollworm
(3) Armyworm (4) Budworm

**146.** All the following are features of an ideal contraceptive **except**
(1) User friendly
(2) Interference with libido and act of coitus
(3) No/least side-effect
(4) Reversible

**147.** Read the following statements carefully and choose the incorrect one w.r.t. acromegaly.
(1) Caused due to over secretion of GH
(2) Severe disfigurement of the face
(3) Abnormal growth of the body leading to gigantism
(4) Remains undetected for years, until changes in external features become noticeable

**148.** All the following are correct w.r.t. synapses, **except**
(1) Formed by the membranes of a pre-synaptic and post-synaptic neuron
(2) Synaptic cleft is always present
(3) Electrical synapse is rare in our system
(4) Electrical current can flow directly from one neuron into another neuron across the electrical synapse

**149.** Vertebrate hearts are an example of
(1) Analogous organs
(2) Divergent evolution
(3) Co-evolution
(4) Convergent evolution

**150.** The parenchymatous cells which lie between xylem and phloem are called
(1) Stele (2) Conjunctive tissue
(3) Pericycle (4) Endodermis

**151.** Which of the following is **wrongly** matched?

| | | |
|---|---|---|
| (1) | Activation of amino acids | – ATP utilizing step |
| (2) | Untranslated regions | – Present before and after a translation unit |
| (3) | Release factor | – Binds to the stop codon |
| (4) | Ribozyme | – Digests RNA molecules |

**152.** Choose the incorrect statement w.r.t. dinosaurs.

(1) Tyrannosaurus rex was biggest amongst dinosaurs

(2) They disappeared from earth about 65 mya

(3) Some says climate changes killed them

(4) Small sized reptiles of that era do not exist today

**153.** If the gene-of-interest is inserted at Pvu I site of vector pBR322, then the recombinants will be sensitive to

(1) Tetracycline only

(2) Ampicillin only

(3) Both ampicillin and tetracycline

(4) Both tetracycline and kanamycin

**154.** Consider the given statements and select the **correct** option.

**Statement A:** A unique vascular connection that exists between digestive tract and the kidney is called renal portal system

**Statement B:** Normal activities of the heart are regulated intrinsically i.e. auto regulated.

(1) Both statements are correct

(2) Both statements are incorrect

(3) Only statement A is correct

(4) Only statement B is correct

**155.** The **correct** sequence of steps of PCR for each cycle is

(1) Extension → Denaturation → Annealing

(2) Extension → Annealing → Denaturation

(3) Annealing → Denaturation → Extension

(4) Denaturation → Annealing → Extension

**156.** Conditional absorption of sodium ion and water takes place in which segment of nephron

(1) PCT

(2) DCT

(3) HL

(4) Glomerulus

**157.** The first heart sound (lub) is associated with the

(1) Closure of Mitral valves

(2) Opening of tricuspid valves

(3) Closure of semilunar valves

(4) Opening of atrio-ventricular valves

**158.** **Assertion A:** The opening between right atrium and right ventricle is guarded by valve known as tricuspid valve.

**Reason R:** Right AV valve is made up of three muscular flaps or cusps

(1) Both A and R are true but R is NOT the correct explanation of A.

(2) A is true but R is false.

(3) A is false but R is true.

(4) Both A and R are true and R is the correct explanation of A.

**159.** How do sympathetic neural signals affect the working of heart?

(1) Reduce heart rate

(2) Increase cardiac output

(3) Heart rate increases but cardiac output decreases

(4) Decrease the strength of ventricular contraction

**160.** **Statement I:** Secretory phase and proliferative phase are the uterine events during a menstrual cycle

**Statement II:** Meiotic divisions which occur in primary and secondary oocytes divide their cytoplasm unequally.

(1) Both Statement I and Statement II are false.

(2) Statement I is true but Statement II is false.

(3) Statement I is false but Statement II is true.

(4) Both Statement I and Statement II are true.

**161.** Which of the following hormones reaches peak twice during a menstrual cycle?

(1) Progesterone (2) LH

(3) FSH (4) Oestrogen

**162.** A tiny-finger like erectile structure 'X' in females is analogous to penis of males and is situated at the upper junction of the two labia minora.

Identify 'X' and select the correct option.

(1) Labia majora (2) Clitoris

(3) Hymen (4) Mons pubis

**163.** To prevent the infestation of Melodogyne incognita in tobacco plants, a strategy was adopted, based on which of the following processes?

(1) PCR (2) ELISA

(3) RNAi (4) Transformation

**164.** Which of the following statements is **correct**?

(A) *Periplaneta americana* are about 34-53 mm long

(B) In each segment of cockroach, endoskeleton has hardened plates called sclerites

(C) Cockroaches are nocturnal omnivores that live in damp places throughout the world

(D) Cockroach belongs to class Insecta of phylum Arthropoda.

(1) A, B, C and D (2) A, B and C

(3) A, C and D (4) A, B and D

**165.** Select the correct pair of organisms wr.t. presence of a common chamber for alimentary, urinary and reproductive tracts which opens to the exterior.

(1) Bufo and Labeo

(2) Salamandra and Testudo

(3) Calotes and Camelus

(4) Hippocampus and *Balaenoptera*

**166.** **Assertion (A):** At puberty, only 60,000-80,000 primary follicles are left in each ovary.

**Reason (R):** A large number of these follicles degenerate during the phase from birth to puberty.

(1) Both (A) and (R) are correct and (R) is the correct explanation of (A)

(2) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

(3) (A) is true, (R) is false

(4) (A) is false, (R) is true

**167.** Select the **correct** match.

| | | |
|---|---|---|
| (1) | Sea urchin and sea hare | – Echinodermata |
| (2) | Fighting fish and saw fish | – Osteichthyes |
| (3) | Vulture and dolphin | – Mammalia |
| (4) | Apple snail and tusk shell | – Mollusca |

**168.** Arrange the given reproductive events of human in their chronological order and select the **correct** option.

a. Fertilisation b. Insemination

c. Gametogenesis d. Implantation

e. Parturition f. Gestation

(1) $c \rightarrow b \rightarrow a \rightarrow d \rightarrow f \rightarrow e$

(2) $c \rightarrow b \rightarrow a \rightarrow f \rightarrow d \rightarrow e$

(3) $e \rightarrow f \rightarrow d \rightarrow a \rightarrow b \rightarrow c$

(4) $c \rightarrow b \rightarrow f \rightarrow a \rightarrow d \rightarrow e$

**169.** **Statement I:** Body surface of annelids is distinctly marked out into segments or Metamers.

**Statement II:** Terrestrial annelids like *Nereis* possess lateral appendages, parapodia, *which* help in swimming.

(1) Both Statement I and Statement II are false.

(2) Statement I is true but Statement II is false.

(3) Statement I is false but Statement II is true.

(4) Both Statement I and Statement II are true.

**170.** Read the following statements.

A. Louis Pasteur careful with experimentation demonstrated biogenesis by are-sterilized swan neck flask.

B. Oparin-Haldane stated that the first form of life could have come from pre-existing chemicals.

C. The condition on earth were high temperature volcanic storm, reducing atmosphere contain $CH_4$, $NH_3$, $O_2$, etc.

D. Sugar, $N_2$-bases, pigment and fats were formed in electric discharge experiment.

Choose the option with all the correct statement:

(1) A, B, C and D (2) A, B and C

(3) A, B and D (4) A, C and D

**171.** The exoskeleton of organism 'P' is made up of polymer of N-acetyl glucosamine whereas organism 'Q' has calcareous endoskeleton.

Select the correct option for the phylum of 'P' and 'Q' respectively.

(1) Echinodermata and Arthropoda

(2) Echinodermata and Mollusca

(3) Arthropoda and Mollusca

(4) Arthropoda and Echinodermata

**172.** In humans, respiration involves several steps. Choose the option that represents third step among the following during respiration.

(1) Diffusion of gases across alveolar membrane

(2) Utilisation of $O_2$ by the cells for catabolic reactions

(3) Transport of gases by the blood

(4) Diffusion of $O_2$ and $CO_2$ between blood and tissue

**173.** Read the following statements and select incorrect one w.r.t. the conduction of nerve impulses.

(A) The rise in stimulus-induced permeability to $Na^+$ is extremely short lives

(B) The electrical potential difference across the resting plasma membrane is called the action potential

(C) The action potential in fact is termed as nerve impulse

(D) At rest, the outer surface of axonal membrane possesses positive charge

(1) Only (B) (2) A and C

(3) A and B (4) A, C and D

**174.** All of the following are correct w.r.t. hormones releasing from neurohypophysis, **except**

(1) Act on smooth muscles of our body and stimulates their contraction

(2) Stimulates reabsorption of water and electrolytes by DCT

(3) Inhibit milk ejection from mammary glands in female

(4) Hyposecretion may cause diabetes insipidus

**175.** Match column-I with column-II and select the **correct** option w.r.t. thoracic chamber.

| Column I | Column II |
|---|---|
| a. Vertebral column | i. Ventral |
| b. Sternum | ii. Dorsal |
| c. Ribs | iii. Lower side |
| d. Diaphragm | iv. Lateral |

(1) a(i), b(ii), c(iii), d(iv)

(2) a(iii), b(iv), c(ii), d(i)

(3) a(ii), b(i), c(iv), d(iii)

(4) a(i), b(iii), c(ii), d(iv)

**176.** Read the given statements.

a. Evolution is a stochastic process based on chance events in nature and chance mutation in the organisms.

b. The Hardy-Weinberg principle says that allele frequencies in a population are stable and constant from generation to generation.

c. The geological history of earth closely correlates with the biological history of earth.

Select the **correct** option.

(1) a, b and c are correct

(2) a, b and c are incorrect

(3) Only statements b and c are correct

(4) Only statements a and c are correct

**177.** **Statement I:** Cyclic menstruation is an indicator of normal reproductive phase

**Statement II:** The part of oviduct closest to the ovary is the site of fusion of male and female gametes

In the light of the above statements, choose the correct answer from the options given below:

(1) Both Statement I and Statement II are false.

(2) Statement I is true but Statement II is false.

(3) Statement I is false but Statement II is true.

(4) Both Statement I and Statement II are true.

**178.** Which points are correct with the regarding of cardiac muscle?

1. Have dark and light bands.
2. Intercalated disc are present.
3. Similar to smooth muscle in structure.
4. Muscle fibres are branched, cylindrical.
5. Get fatigued after a long period.
6. Unstriated and involuntary.

(1) 1, 2, 3, 6 (2) 1, 2, 4

(3) 3, 4, 5 (4) 1, 3, 5

**179.** Sclerenchyma does not/is not

(1) Found in fruit wall of nuts

(2) Provide mechanical support to plant organs

(3) Have protoplasts

(4) Have thick and lignified cells

**180.** Match the following columns and select the **correct** option.

| Column I | Column II |
|---|---|
| a. Anton von Leeuwenhoek | i. Reported that animal cells have thin outer layer |
| b. Matthias Schleiden | ii. Discovered the nucleus |
| c. Robert Brown | iii. Observed that all plants are composed of different type of cells |
| d. Theodore Schwann | iv. First saw and described a live cell |

(1) a(iv), b(i), c(ii), d(iii)

(2) a(iv), b(iii), c(i), d(ii)

(3) a(ii), b(iii), c(iv), d(i)

(4) a(iv), b(iii), c(ii), d(i)

# Syllabus

## FT – 5

**Day & Date : 03 June, 2026**
**Time : 10: 00 AM to 1: 00 PM**
**Physics : FULL COURSE**
**Chemistry : FULL COURSE**
**Biology : FULL COURSE**